

1. EXECUTIVE SUMMARY

This study identifies dominant characteristics, strengths, and weaknesses for a range of non-government organizations (NGO) for managing the utilization of the U.S. elements of the International Space Station (ISS). The five viable options, listed in order of increasing independence from NASA, are NASA Institutes, Consortia, Government Corporations, Government Sponsored Enterprises, and Cooperative Associations. Examples are given for each option highlighting their primary distinguishing characteristics. Most afford financial and management flexibility, relief from restrictive regulations, and some operating cost reduction possibilities. For most, enabling legislation will be required dealing with a) commingling commercial objectives with more traditional research and development, b) liability waivers and indemnification guarantees for its semi-private status, c) exemption from (some) procurement regulations and the Freedom Of Information Act, and d) joint-tenancy for ISS resources with NASA and its International partners.

Non-governmental sources of non-recurring and recurring funds are identified for each option but subsidies and grants will undoubtedly be important in the early phases of ISS operation. In the longer term, self-sustaining operation of the ISS facilities will depend upon the commercial sectors success in using the ISS. Two sources of funding are particularly noted, viz., royalties derived from sales of products created using ISS-developed technology, and access fees for discretionary use by commercial entities. The start-up funding depends upon the approach used to establish the NGO. The approaches identified, in addition to either state or federally mandated, are procurement contracts, grants, cooperative agreements, and Other Transactions.

2. INTRODUCTION

The purpose of this study is to characterize the different organizational options for managing the utilization of the International Space Station and define metrics or features for selecting an optimum approach which is consistent with the objectives and terms stated in the Space Act. The term utilization refers to all activities leading to and performing research, technology development, and commercial process development either as an ISS attached payload or within the pressurized laboratories.

The reduction of costs to provide greater access to space and encourage the growth and innovation of scientific research is a primary aim of the Space Station utilization plan. It is generally assumed that reducing the cost of integration, qualification and launching of payloads encourages greater industry participation and public interest in the Space Station. However, we also need to seek innovative ways of conducting business in order to realize meaningful cost reductions.

2.1. Definition of a Non-Government Organization

A Non-Government Organization (NGO) is being considered as an alternative operational entity for managing the utilization of the International Space Station (ISS). A strawman description¹ of such an approach has been developed by NASA for discussion purposes.

Definition of Terms

An NGO is defined as a financially self-sustaining² enterprise serving the general public by providing goods or services that are not available through standard commercial means. Although by definition, an NGO is not part of the government, the government often does participate in the overall management of the NGO by virtue of its membership on the NGO Board of Directors. In addition, the overall policy and direction of the NGO can be established through the terms of its charter as stipulated in its enabling legislation.

Using an NGO approach essentially privatizes both the management and operational functions associated with conducting research, technology development and commercial uses of the ISS. This enterprise is subject to the provisions of Title 31 and/or Government Corporation Control Act (31 USC 91). It is not necessarily fully federally or state funded or operated. In contrast, a Government Organization (GO) is one wholly funded by the Government and managed by government personnel, e.g., an executive agency.

This report considers a range of viable possibilities for implementing an NGO including:

- Government and/or Public Corporations
- State Agencies or Authorities
- Government Sponsored Enterprises
- Consortia/Institutes
- Cooperatives and Associations
- NASA Institutes and Commercial Space Centers

The two more traditional GO options not being considered include direct management by NASA Headquarters using either Field Centers or other Federal Agencies. A Principal Investigator (either University or Commercial based) approach was not considered appropriate for an operational vehicle with multiple experiments, and therefore is not discussed here.

¹ "Reference Model of A Non-government Organization for Space Station Utilization Management". M. Uhran, NASA Headquarters, Code UM. October 1998.

² Self-sustaining does not preclude receiving subsidies from the government.

The viability of using an NGO is well established in many national and international endeavors. Examples of NGO types are described in Section 3. Under the Space Act³, Title 42, chapter 26, subchapter 11, NASA is empowered to either conduct or arrange for the conduct of scientific measurements and, also, to encourage the fullest commercial use of space. It also serves as the provider of access to commercial space services for Federal government use. To accomplish these goals, NASA is empowered to acquire (by purchase, lease, condemnation, or otherwise), construct, improve, repair, operate, and maintain laboratories, research and testing facilities, space vehicles”, etc. NASA also may “...sell and otherwise dispose of real and personal property (including patents and rights thereunder”) in accordance with the provisions of the Federal Property and Administrative Services Act of 1949, as amended⁴. An interpretation of this provision is that if NASA were to relinquish control of a space asset, it would still serve as the agent for negotiating access to space/ground assets which it no longer “controls”. The Space Act also stipulates that NASA may “accept unconditional gifts or donations of services, money, or property.” An important provision of the Space Act is that NASA is authorized “to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any agency..., state, ...person, firm, association, corporation, or educational institution.” This provision defines the range of both parties and instruments that can be employed to conduct its business; these will all be considered in this study.

2.2. Why an NGO

Congress, through the 1998 Commercial Space Act⁵, states its objective as to encourage the development of a commercial space industry and to reduce the cost to the Government of operations. These requirements or objectives establish the framework for selecting the approach for managing ISS utilization. Three principal reasons provide a basic rationale for using an NGO rather than a government entity itself. They are:

- Relief from binding regulations
- Financial and management flexibility
- Reduced cost of ISS utilization.

³ Reference: 42 U.S.C. Sec. 2473

⁴ Reference: 40 U.S.C. 471 et seq.

⁵ “...The Congress further declares that the use of free market principles in operating, servicing, allocating the use of, and adding capabilities to the Space Station, the resulting fullest possible engagement of commercial providers and participation of commercial users, will reduce Space Station operational costs for all partners and the Federal Government's share of the United States burden to fund operations.” Commercial Space Act of 1998, sec. 101, entitled Commercialization of Space Station.

This rationale supports the Congressional objective as well as encompassing the principal requirements of users, sponsors and investors⁶. The ISS user's needs can be conservatively assumed to be that securing access to the ISS must be equitable, execution of experiments or programs needs to be assured and timely, and the costs for project development, integration and operation aboard ISS must be consistent with the expected scientific or business return. In addition, for a commercial user, the cost-benefit of ISS utilization should be competitive in the space market and quantifiable in real dollars. From a sponsor's or investor's perspective, the management approach should minimize non-productive overhead cost, provide equitable management control in proportion to the investment, and have a capability of attracting new capital investments.

Many precedents exist for NGOs. Some of the more familiar examples are discussed in the next section.

3. MANAGEMENT APPROACHES

This section characterizes the various management options along with examples highlighting key features.

3.1. Definition of Corporation

A corporation may be defined as a legal entity, enabled by legislation, that permits a group of people, either as shareholders (for-profit companies) or members (non-profit companies), to create an organization which can then focus on pursuing set objectives, and which is empowered with legal rights. In general terms, the three types of corporations are: Public, in which stock can be owned by the public at large; Private, which is owned by its employees or a select group of shareholders; and Government, in which stock is wholly or partially owned by the government. Although somewhat misleading, a Government Corporation is often termed a "Public Corporation" because it is established and governed for the public good through the auspices of the Government. In this study, we shall use these synonymously. The traditional commercial corporation could serve to implement tasks from an NGO under contract or subcontract to it but would not be a viable management entity for the NGO itself initially. Also, a Government Corporation can indeed transition to becoming a traditional public one. In the context of implementing an NGO, we shall later redefine "Private Corporation".

3.2. Government Corporation

⁶ In this study, it is assumed that the "investor" provides funds for disbursement by the NGO for either philanthropic or business reasons. In effect, the NGO serves as the arbiter of entrepreneurial funding.